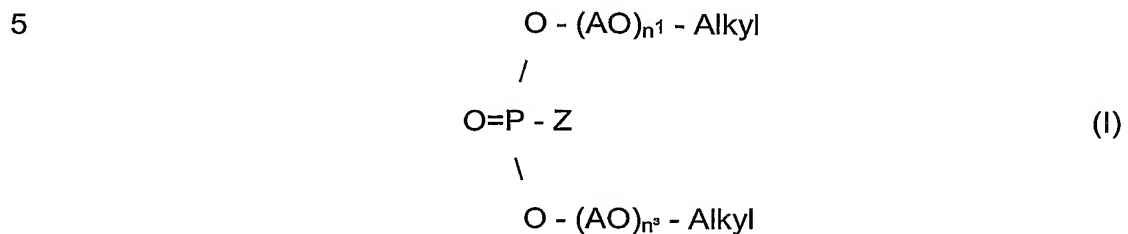


Claims

1. A corrosion inhibitor system for surfaces of aluminum or colored metals and alloys thereof, the system comprising

a) at least one alkyleneoxy-alkyl phosphate di- or triester having the general formula



10 where Z is either -O-M or -O - (AO)_{n²} - Alkyl wherein

M is an ammonium, alkali metal or alkaline earth metal cation,

15 Alkyl independent from each other, is a straight or branched, saturated or unsaturated alkyl group having from 5 to 22, preferably 8 to 18, more preferably 12 to 16 carbon atoms or is an alkylaryl group wherein alkyl is as defined above and aryl is a monocyclic or bicyclic aromatic group,

20 AO represents an alkylene oxide having from 2 to 4, preferably 2 to 3 carbon atoms which may be substituted by one or more C₁₋₃ alkyl groups, and

n¹, n² and n³ independent from each other are an integer of from 2 to 10, preferably 2 to 8, more preferably 3 to 6;

25 b) at least one alkaline agent in an amount sufficient to achieve a pH of > 7.0 in the global system,

c) optionally at least one chelating agent,

d) optionally at least one alkanolamine as an additional corrosion inhibiting agent and/or a further corrosion co-inhibitor,

30 e) optionally at least one anionic, cationic, nonionic, zwitterionic and/or amphoteric surfactant and

f) water.

2. The corrosion inhibitor system according to claim 1 wherein in formula (I) of component (a) AO represents ethylene oxide (EO), propylene oxide (PO) and/or butylene oxide (BO), wherein EO, PO and BO can be present in any sequence order.

3. The corrosion inhibitor system according to claim 2, wherein AO represents ethylene oxide and/or propylene oxide.

4. The corrosion inhibitor system according to any of claims 1 to 3, wherein the alkaline agent (component (b)) is selected from the group consisting of sodium and potassium hydroxides, sodium and potassium tripolyphosphates, ammonium, sodium and potassium carbonates and/or
5 hydrogencarbonates and amines.

5. The corrosion inhibitor system according to any of claims 1 to 4, wherein the chelating agent (component (c)) is selected from the group consisting of aminocarboxylic acids and salts thereof, phosphonic acids and salts thereof, gluconic acid and salts thereof and water-soluble acrylic
5 polymers.

6. The corrosion inhibitor system according to claim 5, wherein the chelating agent is selected from the group consisting of iminodisuccinic acid (IDS), nitrilotriacetic acid (NTA), ethylenediamine tetraacetic acid (EDTA), N-hydroxyethyl-ethylenediamine triacetic acid (HEDTA), diethylenetriamine
5 pentaacetic acid (DTPA), glutamic-N,N-diacetic acid (GLDA), aspartic-N,N-diacetic acid (ASDA), methylglycine diacetic acid (MGDA), hydroxyethyl iminodiacetic acid (HEIDA), triethylenetetramine hexaacetic acid (TTHA) and salts thereof.

7. The corrosion inhibitor system according to any of claims 1 to 6, wherein the alkanolamine (component (d)) is diethanolamine or triethanolamine.

8. The corrosion inhibitor system according to any of claims 1 to 7, wherein the surfactant (component (e)) is

a nonionic surfactant selected from the group consisting of ethoxylated alkylphenols, ethoxylated aliphatic alcohols, ethoxylated amines, ethoxylated etheramines, carboxylic esters, carboxylic amides, polyoxyalkyleneoxide block-copolymers and alkylated alkylethoxylates and/or

an anionic surfactant selected from the group consisting of alkoxyated hydrocarbyl carboxylate, sulfonate, sulfate and phosphate esters, and/or

a cationic surfactant selected from the group consisting of quaternary hydrocarbyl ammonium halides, and/or

a zwitterionic or amphoteric surfactant selected from betaine and sulfobetaine surfactants.

9. The corrosion inhibitor system according to any of claims 1 to 8, further comprising at least one hydrotrope and/or at least one defoamer.

10. The corrosion inhibitor system according to claim 9, wherein the hydrotrope is selected from the group consisting of monofunctional and polyfunctional alcohols and glycol and glycolether compounds, preferably alkyl alcohols, more preferably ethanol and isopropanol, and polyfunctional organic alcohols, preferably glycerol, hexylene glycol, polyethylene glycol, propylene glycol and sorbitol, especially alkyl glycols.

11. The corrosion inhibitor system according to claim 9 or 10, wherein the defoamer is selected from the group consisting of silicone compounds, preferably silica dispersed in polydimethylsiloxane, fatty amides, hydrocarbon waxes, fatty acids, fatty esters, fatty alcohols, fatty acid soaps,

- 5 ethoxylates, mineral oils, polyethylene glycolesters and polyoxyethylene-polyoxypropylene block copolymers.

12. The corrosion inhibitor system according to any of claims 1 to 11, additionally containing a corrosion co-inhibitor, selected from the group consisting of triazoles and derivatives thereof, preferably benzotriazole and tolyltriazole, imidazoline and derivatives thereof, preferably 1-aminoethyl-2-
5 heptadecenyl imidazoline, and thiazole and derivatives thereof, preferably mercaptobenzothiazole and mixtures thereof.

13. The corrosion inhibitor system according to any of claims 1 to 12, comprising:

- a) from 0.01 to 15, preferably 0.1 to 10, more preferably 0.5 to 5 wt.% of the alkyleneoxy-alkyl phosphate di- or triester of general
5 formula (I),
b) from 0.5 to 50, preferably 1 to 20, more preferably 3 to 8 wt.% of alkaline agent the amount being sufficient to achieve a pH of > 7.0 in the global system,
c) optionally from 0.01 to 50, preferably 0.5 to 20, more
10 preferably 1 to 6 wt.% of chelating agent,
d) optionally from 0.05 to 10, preferably 0.1 to 5 wt.% of alkanolamine and/or further corrosion co-inhibitor,
e) optionally from 0.1 to 98, preferably 1 to 20, more preferably 3 to 8 wt.% of surfactant and
15 f) water for the balance.

14. The corrosion inhibitor system according to any of claims 9 to 13, comprising

- from 0.01 to 20, preferably 0.5 to 10 wt.% of hydrotrope and/or
from 0.01 to 10, preferably 0.5 to 8, more preferably 0.1 to 5
5 wt.% of defoaming agent.

15. A cleaning and corrosion inhibiting composition for surfaces of aluminum or colored metals and alloys thereof in the form of a concentrate or a diluted use solution, the composition comprising the components as defined in any claims 1 to 14 in amounts as disclosed in any claims 1 to 14.

16. The cleaning and corrosion inhibiting composition according to claim 15 in the form of a concentrate comprising:

- 5 a) from 0.01 to 15, preferably 0.1 to 10, more preferably 0.5 to 5 wt.% of alkyleneoxy-alkyl phosphate di- or triester of general formula (I),
- b) from 0.5 to 50, preferably 1 to 20, more preferably 3 to 8 wt.% of alkaline agent, the amount being sufficient to achieve a pH of > 7.0 in the global system,
- 10 c) optionally from 0.01 to 50, preferably 0.5 to 20, more preferably 1 to 6 wt.% of chelating agent,
- d) optionally from 0.05 to 10, preferably 0.1 to 5 wt.% of alkanolamine and/or further corrosion co-inhibitor,
- e) optionally from 0.1 to 98, preferably 1 to 20, more preferably 3 to 8 wt.% of surfactant and
- 15 f) water for the balance.

17. The cleaning and corrosion inhibiting composition according to claim 15 in the form of a diluted use solution comprising

- 5 a) from 0.0001 to 0.15, preferably 0.001 to 0.10, more preferably 0.005 to 0.05 wt.% of alkyleneoxy-alkyl phosphate di- or triester of general formula (I),
- b) from 0.005 to 0.50, preferably 0.01 to 0.20, more preferably 0.03 to 0.08 wt.% of alkaline agent, the amount being sufficient to achieve a pH of > 7.0 in the global system,
- 10 c) optionally from 0.0001 to 0.50, preferably 0.005 to 0.20, more preferably 0.01 to 0.06 wt.% of chelating agent,

- d) optionally from 0.0005 to 0.10, preferably 0.001 to 0.05 wt.% of alkanolamine, and/or further corrosion co-inhibitor,
- e) optionally from 0.001 to 0.98, preferably 0.01 to 0.20, more preferably 0.03 to 0.08 wt.% of surfactant and
- 15 f) water for the balance.

18. A process for treating surfaces of aluminum or colored metals and alloys thereof, preferably of copper, brass, bronze, zinc, and bismuth, the process comprising

- 5 subjecting the metal surfaces to the corrosion inhibitor system according to any of claims 1 to 14 at a temperature of from 0 to 80 °C, preferably 10 to 60 °C, for 10 s to 60 min, preferably 20 s to 20 min.

19. A process for treating surfaces of aluminum or colored metals and alloys thereof, preferably of copper, brass, bronze, zinc, and bismuth, the process comprising

- 5 contacting the metal surfaces with an effective amount of a concentrate or a diluted use solution of the cleaning and corrosion inhibiting composition according to any of claims 15 to 17 at a temperature of from 0 to 80 °C, preferably 10 to 60 °C, for 10 s to 60 min, preferably 20 s to 20 min.

20. Use of the cleaning and corrosion inhibiting composition according to any of claims 15 to 17 in the form of a concentrate or a diluted use solution or as an additive in an effective amount for treating surfaces of aluminum or colored metals and alloys thereof, preferably of copper, brass,

5 bronze, zinc, and bismuth.